

10/018450

JC10 Rec'd PCT/PTO 14 DEC 2001

Practitioner's Docket No. AP9658

CHAPTER II

TRANSMITTAL LETTER
TO THE UNITED STATES ELECTED OFFICE (EO/US)
(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)

PCT/E00/04802 26/May/2000 17/June/1999
 INTERNATIONAL APPLICATION NO. INTERNATIONAL FILING DATE PRIORITY DATE CLAIMED

Piston Pump
 TITLE OF INVENTION

Hans-Jörg Feigel; Jürgen Schonlau
 APPLICANT(S)

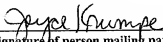
Box PCT
Assistant Commissioner for Patents
Washington D.C. 20231
ATTENTION: EO/US

NOTE: To avoid abandonment of the application, the applicant shall furnish to the USPTO, not later than 20 months from the priority date: (1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the USPTO; and (2) the basic national fee (see 37 C.F.R. § 1.492(a)). The 30-month time limit may not be extended. 37 C.F.R. § 1.495.

WARNING: Where the items are those which can be submitted to complete the entry of the international application into the

CERTIFICATION UNDER 37 C.F.R. 1.10*
(Express Mail label number is mandatory.)
(Express Mail certification is optional.)

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on this date 12/14/01, in an envelope as "Express Mail Post Office to Addressee," Mailing Label Number EV051007731US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

Joyce Krumpke
(type or print name of person mailing paper)

Joyce Krumpke
(Signature of person mailing paper)

WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

***WARNING:** Each paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).
 "Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will not be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

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national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. §1.10 must be used (since international application papers are not covered by an ordinary certificate of mailing - See 37 C.F.R. §1.8.

NOTE: Documents and fees must be clearly identified as a submission to enter the national state under 35 USC 371 otherwise the submission will be considered as being made under 35 USC 111. 37 C.F.R. § 1.494(f).

1. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. 371:
 - a. ☒ [X] This express request to immediately begin national examination procedures (35 U.S.C. 371(f)).
 - b. ☒ [X] The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees (37 C.F.R. § 1.492) as indicated below:

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2. Fees

CLAIMS FEE	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
[]*	TOTAL CLAIMS	17 - 20 =		x \$ 18.00 =	\$
	INDEPENDENT CLAIMS	2 - 3 =		x \$ 84.00 =	
MULTIPLE DEPENDENT CLAIM(S) (if applicable) + \$280.00					
BASIC FEE**	<p>[] U.S. PTO WAS INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where an International preliminary examination fee as set forth in § 1.482 has been paid on the international application to the U.S. PTO:</p> <p>[] and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness) and industrial activity, as defined in PCT Article 33(2) to (4) have been satisfied for all the claims presented in the application entering the national stage (37 CFR 1.492(a)(4)) \$100.00 and the above requirements are not met (37 CFR 1.492(a)(1)) \$710.00</p> <p>[X] U.S. PTO WAS NOT INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where no international preliminary examination fee as set forth in § 1.482 has been paid to the U.S. PTO, and payment of an international search fee as set forth in § 1.445(a)(2) to the U.S. PTO:</p> <p>[] has been paid (37 CFR 1.492(a)(2)) \$740.00 [] has not been paid (37 CFR 1.492(a)(3)) \$1040.00 [X] where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office (37 CFR 1.492(a)(5)) \$890.00</p>				
	Total of above Calculations				= 890.00
SMALL ENTITY	Reduction by ½ for filing by small entity, if applicable. Affidavit must be filed. (note 37 CFR 1.9, 1.27, 1.28)				-
	Subtotal				890.00
	Total National Fee				\$ 890.00
	Fee for recording the enclosed assignment document \$40.00 (37 CFR 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				
TOTAL	Total Fees enclosed				\$ 890.00

*See attached Preliminary Amendment Reducing the Number of Claims.

- i. ☐ A check in the amount of _____ to cover the above fees is enclosed.
 ii. ☒ Please charge Account No. 18-0013 in the amount of \$ 890.00.
 A duplicate copy of this sheet is enclosed.

****WARNING:** "To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date: * * * (2) the basic national fee (see § 1.492(a)). The 30-month time limit may not be extended." 37 C.F.R. § 1.495(b).

WARNING: If the translation of the international application and/or the oath or declaration have not been submitted by the applicant within thirty (30) months from the priority date, such requirements may be met within a time period set by the Office. 37 C.F.R. § 1.495(b)(2). The payment of the surcharge set forth in § 1.492(e) is required as a condition for accepting the oath or declaration later than thirty (30) months after the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than thirty (30) months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 apply to the period which is set. Notice of Jan. 3, 1993, 1147 O.G. 29 to 40.

3. ☒ A copy of the International application as filed (35 U.S.C. 371(c)(2)):

NOTE: Section 1.495 (b) was amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment "The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date." Notice of Jan. 7, 1993, 1147 O.G. 29 to 40, at 35-36. See item 14c below.

- a. ☒ is transmitted herewith.
 b. ☐ is not required, as the application was filed with the United States Receiving Office.
 c. ☐ has been transmitted
 i. ☐ by the International Bureau.
 Date of mailing of the application (from form PCT/IB/308): _____.
 ii. ☐ by applicant on _____.
 Date

4. ☒ A translation of the International application into the English language (35 U.S.C. 371(c)(2)):
 a. ☒ is transmitted herewith.
 b. ☐ is not required as the application was filed in English.
 c. ☐ was previously transmitted by applicant on _____.
 Date
 d. ☐ will follow.

5. ☐ Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. 371(c)(3)):

NOTE: The Notice of January 7, 1993 points out that 37 C.F.R. § 1.495(a) was amended to clarify the existing and continuing practice that PCT Article 19 amendments must be submitted by 30 months from the priority date and this deadline may not be extended. The Notice further advises that: "The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected." 1147 O.G. 29-40, at 36.

- a. ☐ are transmitted herewith.
 - b. ☐ have been transmitted.
 - i. ☐ by the International Bureau.
Date of mailing of the amendment (from form PCT/IB/308): _____.
 - ii. ☐ by applicant on _____.
Date
 - c. ☐ have not been transmitted as
 - i. ☐ applicant chose not to make amendments under PCT Article 19.
Date of mailing of Search Report (from form PCT/ISA/210): _____.
 - ii. ☐ the time limit for the submission of amendments has not yet expired. The amendments or a statement that amendments have not been made will be transmitted before the expiration of the time limit under PCT Rule 46.1.
6. ☐ A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. 371(c)(3)):
 - a. ☐ is transmitted herewith.
 - b. ☐ is not required as the amendments were made in the English language.
 - c. ☐ has not been transmitted for reasons indicated at point 5(c) above.
7. ☐ A copy of the international examination report (PCT/IPEA/409)
 - ☐ is transmitted herewith.
 - ☐ is not required as the application was filed with the United States Receiving Office.
8. ☐ Annex(es) to the international preliminary examination report
 - a. ☐ is/are transmitted herewith.
 - b. ☐ is/are not required as the application was filed with the United States Receiving Office.
9. ☐ A translation of the annexes to the international preliminary examination report
 - a. ☐ is transmitted herewith.
 - b. ☐ is not required as the annexes are in the English language.
10. [X] An oath or declaration of the inventor (35 U.S.C. 371(c)(4)) complying with 35 U.S.C. 115
 - a. ☐ was previously submitted by applicant on _____.
Date
 - b. ☐ is submitted herewith, and such oath or declaration
 - i. ☐ is attached to the application.
 - ii. ☐ identifies the application and any amendments under PCT Article 19 that were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that they were reviewed by the inventor as required by 37 C.F.R. 1.70.

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iii. ☒ will follow.

Other document(s) or information included:

11. ☒ An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):

- a. ☒ is transmitted herewith.
 b. ☐ has been transmitted by the International Bureau.
 Date of mailing (from form PCT/IB/308): _____
 c. ☐ is not required, as the application was searched by the United States International Searching Authority.
 d. ☐ will be transmitted promptly upon request.
 e. ☐ has been submitted by applicant on _____
 Date

12. ☒ An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98:

- a. ☒ is transmitted herewith.
 Also transmitted herewith is/are:
☒ Form PTO-1449 (PTO/SB/08A and 08B).
☒ Copies of citations listed.
 b. ☐ will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. 371(c).
 c. ☐ was previously submitted by applicant on _____
 Date

13. ☐ An assignment document is transmitted herewith for recording.

A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

14. ☒ Additional documents:

- a. ☐ Copy of request (PCT/RO/101)
 b. ☒ International Publication No. WO00/78583
 i. ☐ Specification, claims and drawing
 ii. ☒ Front page only
 c. ☒ Preliminary amendment (37 C.F.R. § 1.121)
 d. ☐ Other

15. ☒ The above checked items are being transmitted

- a. ☒ before 30 months from any claimed priority date.
 b. ☐ after 30 months.

16. ☐ Certain requirements under 35 U.S.C. 371 were previously submitted by the applicant on _____, namely:

AUTHORIZATION TO CHARGE ADDITIONAL FEES

WARNING: *Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges if extra claims are authorized.*

NOTE: *"A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).*

NOTE: *"Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).*

- ☒ The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to Account No. 18-0013.

- ☒ 37 C.F.R. 1.492(a)(1), (2), (3), and (4) (filing fees)

WARNING: *Because failure to pay the national fee within 30 months without extension (37 C.F.R. § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.*

- ☒ 37 C.F.R. 1.492(b), (c) and (d) (presentation of extra claims)

NOTE: *Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.*

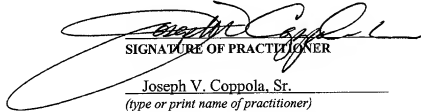
- ☒ 37 C.F.R. 1.17 (application processing fees)
☒ 37 C.F.R. 1.17(a)(1)-(5)(extension fees pursuant to § 1.136(a).
☐ 37 C.F.R. 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. 1.311(b))

NOTE: *Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of*

allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

☒ [X] 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).


SIGNATURE OF PRACTITIONER
Joseph V. Coppola, Sr.
(type or print name of practitioner)

Reg. No.: 33,373

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Feigel et al

Int'l Application No.: PCT/E00/04802

Int'l Filing Date: 26/May/2000

Serial No.:

Group Art Unit:

Filed: Herewith

Examiner:

For: Piston Pump

Attorney Docket No.: AP9658

Paper No.

Box PCT
Commissioner of Patents
Washington, D.C. 20231
Attn: EO/US

CERTIFICATE OF MAILING/TRANSMISSION (37 CFR 1.8(a))

I hereby certify that this correspondence is, on the date shown below, being:

☒ deposited with the United States Postal Service with sufficient postage as Express Mail, Post Office to Addressee, Mailing Label No.: EV051007731US, addressed to Box PCT, Commissioner of Patents, Washington, DC 20231

☐ transmitted by facsimile to the Patent and Trademark Office, to Examiner _____ at _____

Signature Joyce Krampe
Joyce Krampe

Date: 12/14/01

PRELIMINARY AMENDMENT

Dear Sir:

Please amend the application as follows prior to examination on the merits.

IN THE CLAIMS

Please cancel claims 1-15 and add the following new claims.

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16. (New) Actuation device for a motor vehicle, including a pedal stand that can be mounted on the vehicle and has articulated to it a base member that is swivelling about a first axis and fixable by means of an adjustment device, comprising:

a housing for a hydraulic or electromechanic generator that points into a vehicle interior in opposition to a direction of actuation,

a pedal lever which is pivoted at the base member and includes two legs wherein foot pressure is applicable to the first leg, and wherein the second leg acts on the generator.

17. (New) Actuation device as claimed in claim 16, wherein the pedal lever is provided as a torque-transmission or torque deviation means which deviates a force that does not act in the direction of actuation on the actuation device into an actuating force in the actuation direction, and in that a swivelling movement of the pedal lever is brought about with the torque-transmission or torque deviation means.

18. (New) Actuation device as claimed in claim 16, wherein the pedal lever is provided as a torque-transmission or torque deviation means, and in that the lever due to the swivelling movement initiates a brake actuation independent of the driver in the case of a vehicle deformation.

19. (New) Actuation device as claimed in claim 16, wherein a foot actuation part is arranged at the first leg of the pedal lever, and in that provided at the second leg is a point of articulation at which an actuating member for the generator can be secured, and in that the second lever arm includes a baffle head which, in the event of a vehicle deformation due to an accident, comes into a force-transmitting contact with a component part that enters into the passenger compartment in opposition to the direction of actuation earlier than the first lever arm does.

20. (New) Actuation device as claimed in claim 16, wherein the legs are diametrically opposed.

21. (New) Actuation device as claimed claim 16, wherein the adjustment device includes a threaded spindle-and-nut arrangement which permits a determinable swivelling movement of the base member in relation to the pedal stand that is securable to a vehicle so that the position of the pedal lever in relation to the generator is maintained.

22. (New) Actuation device as claimed claim 16, wherein an electric motor is provided as a drive for the adjustment device and is connected to a control unit by means of a bus link, especially by using the CAN protocol, and in that associated with the control unit is a memory module unit for storing adjustment positions of several adjustment devices.

23. (New) Actuation device as claimed in claim 22, wherein the control unit and the memory module unit for the adjustment device is a part of a control unit for an electronically controlled vehicle brake system.

24. (New) Actuation device for a motor vehicle, comprising:
a pedal stand mounted on the vehicle,
a swivelling base member joined to the pedal stand by way of bearing means,
an adjustment device spaced from the pedal stand and the base member, wherein the articulation of the base member at the pedal stand can be released so that the base member along with at least one pedal lever articulated thereon is mounted at the pedal stand so as to be swivelling about another axis.

25. (New) Actuation device as claimed in claim 24, wherein the other axis is defined by a point of articulation of the adjustment device at the base member or by a point of articulation of the adjustment device at the pedal stand.

26. (New) Actuation device as claimed in claim 24, wherein the bearing means for the first axis is adapted to be released due to a displacement of the base member in relation to the pedal stand, or vice versa.

27. (New) Actuation device as claimed in claim 24, wherein the bearing means includes a claw that is partly open and provided at the pedal stand for a bearing axis provided at the base member so that the articulation can be released due to a relative displacement between the base member and the pedal stand.

28. (New) Actuation device as claimed in claim 24, wherein the bearing means includes a claw that is partly open and provided at the base member for a bearing axis provided at the pedal stand so that the articulation can be released due to a relative displacement between the base member and the pedal stand.

29. (New) Actuation device as claimed in claim 24, wherein a torque transmission or torque deviation means is provided which deviates a force, that does not act in the direction of actuation on the actuation device, in the actuation direction B and transmits it to the pedal stand or to the base member so that the articulation of the base member at the pedal stand can be released due to a relative displacement.

30. (New) Actuation device as claimed in claim 24, wherein an adjustment device is provided wherein the adjustment device includes a threaded spindle-and-nut arrangement which permits a determinable swivelling movement of the base member in relation to the pedal stand that is securable to a vehicle so that the position of the pedal lever in relation to the generator is maintained.

31. (New) Actuation device as claimed in claim 24, wherein an adjustment device is provided wherein an electric motor is provided as a drive for the adjustment device and is connected to a control unit by means of a bus link, especially by using the CAN protocol, and in that associated with the control unit is a memory module unit for storing adjustment positions of several adjustment devices.

32. (New) Actuation device as claimed in claim 31, wherein an adjustment device is provided wherein the control unit and the memory module unit for the adjustment device is a part of a control unit for an electronically controlled vehicle brake system.

REMARKS

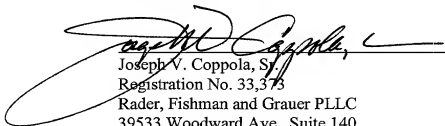
Prior to a formal examination of the above-identified application, acceptance of the new claims and the enclosed substitute specification (under 37 CFR 1.125) is respectfully requested. It is believed that the substitute specification and new claims will facilitate processing of the application in accordance with M.P.E.P. 608.01(q). The substitute specification and new claims are in compliance with 37 CFR 1.52 (a and b) and, while making no substantive changes, are submitted to conform this case to the formal requirements and long-established formal standards of U.S. Patent Office practice, and to provide improved idiom and better grammatical form.

The enclosed substitute specification is presented herein in both marked-up and clean versions.

STATEMENT

The undersigned, an attorney registered to practice before the office, hereby states that the enclosed substitute specification includes the same changes as are indicated in the mark-up copy of the original specification. The substitute specification contains no new subject matter.

Respectfully submitted,



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Actuation Device for a Motor Vehicle

The present invention relates to an actuation device for a motor vehicle.

Actuation devices are principally known in the art, especially as regards the actuation of clutches, and they must satisfy most different requirements. On the one hand, it is imperative for the device to need only little mounting space because the space requirement of this assembly reduces the space that can be used for passengers in the vehicle interior. What is also detrimental to the space available is the steering column that must be passed through a body wall in the area of the point of attachment for a pedal stand. In addition, there are many transverse reinforcements in this area which extend in the way of a horizontally extending support member from one vehicle side to the other vehicle side and thereby reinforce the vehicle compartment.

Because the actuation device has to satisfy the comfort requirements of various operators, the adjustability and adaptability of the pedal lever position to different drivers of different heights, especially buttock-to-ankle length, is absolutely necessary.

Also, the actuation device must comply with safety requirements, i.e., it must have a favorable collision performance. In view of the above, a large number of most different concepts have become known to withdraw the pedal lever actively from the operator in the case of a crash.

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The different approaches available eliminate the above-mentioned problems only in part. Thus, e.g. solutions for swivelling a pedal assembly comprised of master brake cylinder and brake force booster in the case of a crash are not appropriate for the adjustability of the pedal lever position.

In addition, it is a basic need to procure the actuation device from a supplier as an independent unit, quasi isolated from the other vehicle components, to easily mount it onto the vehicle, and to transfer the same solution to other vehicle types. DE 196 17 372 A1 discloses a pedal assembly wherein in the case of a crash a pyrotechnical propellant is ignited, and the gas pressure thereof drives a piston device so that a pedal lever articulation arrangement is released by means of a locking element. A device of this type necessitates a crash sensor and an electronic control unit which sends an ignition signal to the propellant. The employment of pyrotechnical components in a vehicle requires special safety provisions even during the assembly at the vehicle maker's premises because erroneous activations must be avoided in any case at any time.

An object of the present invention is to provide an actuation device which overcomes all above-mentioned problems and, in addition, permits being integrated into different vehicle types at low cost, without the necessity of special safety provisions for the prevention of malfunctions.

This object is achieved by the characterizing features of patent claims 1 and 9. Further details of the present invention can be taken from the subclaims by making reference to the description and the accompanying drawings.

Referring to the drawings, a schematic view of Figures 1 and 2 shows an embodiment of a first actuation device in the maximum front adjustment position and in the maximum rear adjustment

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position with respect to an operator (not shown), and the actuation end position is shown in dotted lines in each case. Figure 3 shows a schematic view of an embodiment of a second actuation device, and Figure 4 depicts the same actuation device after a major collision with a deformation of the vehicle compartment in a greatly simplified sketch.

The actuation device as shown in Figures 1 and 2 has a two-leg pedal lever 1 which is articulated swivellingly at a base member 2 by means of a bolt 3 acting as an axis. Foot pressure can be applied to the first leg 8 of the pedal lever 1, and the second lever 9 acts on a (preferably hydraulic) generator 12, formed fast with the base member, for a hydraulic booster, master brake cylinder, or electromechanic generator 12 for an electromechanic brake device.

The base member 2 is pivoted to a pedal stand 4 which can be secured to a component part 5 formed fast with a vehicle, i.e., a wall, a mounting support, or a similar member. For reasons of standardization, the swing joint between the pedal stand 4 and the base member 2 is preferably effected also by means of a bolt 6, however, any type of swivel joint is principally feasible.

An adjustment device 7 including a threaded spindle-and-nut arrangement is interposed between the pedal stand 4 and the base member 2 in order to permit a precisely regulatable adjustment of the actuation device to different persons, as will be explained hereinbelow. The base member 2 along with the pedal lever 1 is swivelling in relation to the pedal stand 4. Further, a purely mechanically active torque transmission or torque deviation means in the shape of a lever is provided and deviates a force K, that does not act in the direction of actuation on the actuation device, into an actuating force in the actuation direction B, and wherein a swivelling movement of

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the pedal lever 1 is produced with the lever-shaped torque-transmission or torque deviation means. In the Figures, a force K opposed to the direction of actuation B is characterized, the cause of which force is e.g. a component part which enters into the vehicle compartment due to an accident, or a drive unit or similar element which is displaced due to an accident. Further, the pedal lever 1 is provided as a torque transmission means and, starting from a pedal lever pivot axis that is pivoted at a base member 2, includes two legs 8, 9 which point in different directions and are opposite each other according to the embodiment. There is provision of a foot plate (pad) 10 at one end of the first leg, and at an end of the second leg there is a point of articulation 11 for an actuating member (push rod, linkage, Bowden cable) of a generator 12, especially a hydraulic generator cylinder, master brake cylinder, electric generator with force simulation, or similar elements. The generator 12 along with the pedal lever 1 is arranged at the base member 2 which, in turn, is pivoted on the pedal stand 4. Thus, pedal lever 1 and generator 12 are jointly swivelling in relation to the pedal stand 4. The position of the pedal lever 1 relative to the generator 12 is consequently unaffected during the displacement movement. A controlled adjustment of the base member 2 can be achieved by means of a preferably motor-driven threaded-spindle-and-nut arrangement or by means of any other type of gear, for example, a worm gear. Another characteristic of the gear employed is that it is a self-locking gear, that means, a position that is adjusted is maintained also in the non-driven condition, without separate locking means. For a special clearance-free locking of the adjustment position it is favorable when the gear is positioned as close as possible to the base member 2 or the pedal stand 4 of the actuation device, without the intermediary of further transmission parts.

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An electric motor 13 is flanged to the base member 2 as a drive unit for the adjustment device 7 according to the embodiment. The electric motor 13 drives a threaded spindle or worm, and these structural elements are preferably arranged at one end of a motor shaft integral therewith. However, it is also possible to couple the motor shaft with the mentioned spindle or worm without departing from the spirit of the present invention. The rotatory spindle or worm movement causes an axial displacement of a type of nut which is mounted on the pedal stand 4. Thus, the adjustment device 7 permits a variation of the relative distance between base member 2 and pedal block 4. The electric motor 13 swivels together with the base member 2 so that the nut that cooperates with the spindle or worm is mounted swivellingly on the pedal stand 4 corresponding to the adjustment position. It is obvious that a connection to the electrical wiring system is provided (not shown in the Figure) for the energy supply of the electric motor 13, and that the energization can be interrupted by means of appropriate switching means. Further, it can be favorable to connect the electric motor 13 to an electric control unit with a memory module unit by means of a data bus link 15 and by using the CAN protocol. In this respect, the memory module unit permits having on hand determined adjustment data of the actuation device, especially related to passengers, subject to recall. A bus link 15 with other electrified adjustment devices, such as a seat adjustment, a steering wheel adjustment, a mirror adjustment, or with adjustment devices of other pedal levers of a pedal assembly (which e.g. comprises a brake pedal, an engine control pedal, and, possibly, a clutch pedal) permits storing defined positions of further adjustment devices centrally in a joint memory module unit and calling the data upon request, for example, by means of a defined code, so that the adjustment devices will favorably adopt the desired position simultaneously. The effort and structure in the electrical system and also the cost of assembly is effectively reduced

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when the control unit and also the memory module unit is a part of an electric control unit of an electronically controlled vehicle brake system. It is furthermore advantageous that an actuation sensor which is connected to the control unit is associated with the pedal lever 1. The sensor allows a polling with respect to the pedal actuation condition. Because a polling of the actuation status is permanently executed by means of an algorithm that is implemented into the control unit, this renders possible locking the adjustment function for the case of a pedal actuation. In other words, the control unit does not send any adjustment signals to the electric motor 13, or interrupts the motor's energization, in the presence of a case of actuation.

It is equally possible to provide a crank handle or a hand wheel as a drive which introduce the necessary adjustment movements into the gear arranged close to the pedal by means of appropriate adjustment means, for example, a flexible shaft. The flexible shaft consequently permits arranging the crank handle, wheel, or similar element, at a space outside the leg room which is better accessible to the driver.

The actuation device is designed so that, in the event of a crash with deformations of the front part of the vehicle, a force K that does not act in the actuation direction B on the device is deviated into the actuation direction B, and a swivelling movement in the actuation direction is brought about with the help of the pedal lever 1 as a torque transmission means. Along with the swivelling movement occurs a brake actuation independent of the driver which will instantaneously bring a vehicle to a standstill which is still rolling, wobbling, skidding, or out of control in any other manner. Thus, the additional advantage that ensues from the present invention is that the risk for uninvolved road users is reduced

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by minimizing the risk of a consequential accident because a self-braking effect takes place.

As is shown in the Figure 1 embodiment, the force K acts without reversal of direction directly on the generator 12 which is arranged with an actuating rod and an actuating piston and a housing in opposition to the actuation direction B. This means with respect to the first lever arm 8 that a torque transmission takes place insofar as the lever arm is entrained in the actuation direction B, i.e., is withdrawn from the foot area, which reduces the risk of injury. In order that the second lever arm 9 comes into contact with a component part that enters into the passenger compartment earlier than the first lever arm 8 does and transmits the force K to the generator 12, a thickened baffle head 14 is arranged at the second lever arm 9.

The embodiments of Figures 1 and 2 illustrate the respectively non-actuated pedal lever position, and the maximum tilting of the pedal lever under maximum actuating force is shown in dotted lines. Figure 1 relates to the rear adjustment position (close to the seat) which is typically chosen by vehicle occupants with a short body length, and Figure 2 relates to a front adjustment position for vehicle occupants with a large body length.

Another embodiment of the present invention related to a particularly compact design can be seen in Figures 3 and 4. The details which have been described hereinabove with respect to the adjustment device 7 and said's actuation can be transferred to this embodiment. A base member 20 is articulated at a pedal stand 23 that can be mounted fast with the vehicle by means of bearing elements 21 about an imaginary axis 22. The axis 22 principally corresponds to the pivot axis of the above-described actuation device (Figures 1 and 2) and might be

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formed e.g. by a pin, bolt, or any similar member, which is arranged at the base member 20 or the pedal stand 23. A bearing eye 25 which is to be arranged on either the pedal stand 23 or the base member 20 is used to support a bolt 24. Spaced from the axis 22 is an adjustment device 26 which is interposed between the pedal stand 23 and the base member 20 and by which swivelling about the axis 22 can be performed due to extending or shortening corresponding adjusting means. The said Figure primarily shows the rearward end position, with the front adjustment end position of the pedal levers 27, 28 being shown in dotted lines. Consequently, the base member 20 is pivoted on the pedal stand 23 for adjustment by means of the adjustment device 26. Insofar the device is still identical to the solution according to Figures 1 and 2. However, a particularly compact construction is achieved because the base member 20 and the pedal stand 23 are arranged in parallel to each other or at least at an acute angle in relation to each other, with the pedal stand 23 being arranged beneath a steering axis and at the said. An enhanced collision safety is achieved because the frontal deformation of the vehicle compartment brings an end to the articulation of the base member 20 at the pedal stand 23, and the base member 20 along with at least one pedal lever 27, 28 mounted thereon is fitted to the pedal stand 23 so as to be swivelling about another axis. Figure 4 illustrates in this connection principally the deformations which occur after a major impact in the area of a firewall (splashboard) 30 of a vehicle compartment, whereby a component part (such as an engine block, axle, foreign body, or similar elements) is moved in the direction of force K into abutment on the torque transmission means 29. The other, new axis of the base member 20 is defined by a point of articulation of the adjustment device 26 at the pedal stand 23. According to the embodiment, the bearing means 21 (bearing eye 25, bolt) are unlatched due to displacement of the pedal stand 23 and the base member 20 in relation to each other. It is advisable when the bearing eye 25

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is designed to be partly open in the way of a claw, or when a closed bearing eye 25 tears off along a predetermined nominal breaking point due to the relative displacement so that the articulation can be released. For example, an active displacement of the base member 20 including the bolt takes place in the direction of the driver so that the bolt, as is illustrated in Figure 4, is unhinged from the claw. Of course, other equivalently active arrangements are also feasible with respect to the bearing means 21, without departing from the present invention.

It is further advantageous that a torque transmission means or torque deviation means 29 is provided which deviates a force which does not act in the direction of actuation into the direction of actuation and transmits it onto the pedal stand 23 or the base member 20 so that the articulation of the base member 20 at the pedal stand 23 is releasable due to relative displacement. More specifically, the force effect K that originates from a movement of a component part in the direction of the driver is deviated into a direction of actuation B so that there occurs a relative displacement between the base member 20 and the pedal stand 23 which causes unlatching of the first point of articulation. This allows a swivelling movement of the base member 20 that is decoupled (from the original adjustment axis) together with the pedals 27, 28 (about a new swivelling axis) in the direction of the front part of the vehicle, that means, into an undangerous position. It is self-explanatory that all features relating to the adjustment device 26 of the first solution (Figures 1 and 2) can be transferred to the second solution (Figures 3 and 4).

At least one pedal lever articulated to a base member was partly referred to in the above description. Of course, the present invention can be transferred to several pedals which are combined in one single pedal assembly. The present

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invention is appropriate especially for combinations of engine control pedals and brake pedals, or for combinations of engine control, clutch, and brake, wherein one or more brake pedals inhere the features of the present invention and are adjustable separately of each other or jointly.

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Patent Claims:

1. Actuation device for a motor vehicle, including a pedal stand (4) that can be mounted on the vehicle and has articulated to it a base member (2) that is swivelling about a first axis and fixable by means of an adjustment device (7), comprising a housing for a hydraulic or electromechanic generator (12) that points into a vehicle interior in opposition to a direction of actuation (B), and a pedal lever (1) which is pivoted at the base member (2) and includes two legs (8, 9), wherein foot pressure is applicable to the first leg (8), and the second leg (9) acts on the generator (12).
2. Actuation device as claimed in claim 1, characterized in that the pedal lever (1) is provided as a torque-transmission or torque deviation means which deviates a force (K) that does not act in the direction of actuation on the actuation device into an actuating force in the actuation direction (B), and in that a swivelling movement of the pedal lever (1) is brought about with the torque-transmission or torque deviation means.
3. Actuation device as claimed in claim 1, characterized in that the pedal lever (1) is provided as a torque-transmission or torque deviation means, and in that the lever due to the swivelling movement initiates a brake actuation independent of the driver in the case of a vehicle deformation.
4. Actuation device as claimed in claim 1, characterized in that a foot actuation part (10) is arranged at the first leg of the pedal lever, and

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in that provided at the second leg (9) is a point of articulation (11) at which an actuating member for the generator (12) can be secured, and in that the second lever arm (9) includes a baffle head (14) which, in the event of a vehicle deformation due to an accident, comes into a force-transmitting contact with a component part that enters into the passenger compartment in opposition to the direction of actuation earlier than the first lever arm (8) does.

5. Actuation device as claimed in any one or more of the preceding claims,
c h a r a c t e r i z e d in that the legs (8, 9) are diametrically opposed.
6. Actuation device as claimed in any one or more of the preceding claims,
c h a r a c t e r i z e d in that the adjustment device (7) includes a threaded spindle-and-nut arrangement which permits a determinable swivelling movement of the base member (2) in relation to the pedal stand (4) that is securable to a vehicle so that the position of the pedal lever (1) in relation to the generator (12) is maintained.
7. Actuation device as claimed in any one or more of the preceding claims,
c h a r a c t e r i z e d in that an electric motor (13) is provided as a drive for the adjustment device (7) and is connected to a control unit by means of a bus link (15), especially by using the CAN protocol, and in that associated with the control unit is a memory module unit for storing adjustment positions of several adjustment devices.

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8. Actuation device as claimed in claim 7,
c h a r a c t e r i z e d in that the control unit and
the memory module unit for the adjustment device (7) is a
part of a control unit for an electronically controlled
vehicle brake system.
9. Actuation device for a motor vehicle including a pedal
stand (23) that can be mounted on the vehicle, and a base
member (20) that is swivelling about an imaginary axis
(22) and articulated to the pedal stand (23) by way of
bearing means (21), and an adjustment device (26) which is
spaced from the axis (22) between the pedal stand (23) and
the base member (20), wherein the articulation of the
base member (20) at the pedal stand (23) can be released
so that the base member (20) along with at least one pedal
lever (27, 28) articulated thereat is mounted at the pedal
stand (23) so as to be swivelling about another axis.
10. Actuation device as claimed in claim 9,
c h a r a c t e r i z e d in that the other axis is
defined by a point of articulation of the adjustment
device (26) at the base member (20) or by a point of
articulation of the adjustment device (26) at the pedal
stand (23).
11. Actuation device as claimed in claim 9 or 10,
c h a r a c t e r i z e d in that the bearing means (21)
for the first axis (22) is adapted to be released due to a
displacement of the base member (20) in relation to the
pedal stand (23), or vice versa.

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12. Actuation device as claimed in any one or more of claims 9 to 11,
c h a r a c t e r i z e d in that the bearing means (21) includes a claw that is partly open and provided at the pedal stand (23) for a bearing axis provided at the base member (20) so that the articulation can be released due to a relative displacement between the base member (20) and the pedal stand (23).
13. Actuation device as claimed in any one or more of claims 9 to 12,
c h a r a c t e r i z e d in that the bearing means (21) includes a claw that is partly open and provided at the base member (20) for a bearing axis provided at the pedal stand (23) so that the articulation can be released due to a relative displacement between the base member (20) and the pedal stand (23).
14. Actuation device as claimed in any one or more of claims 9 to 13,
c h a r a c t e r i z e d in that a torque transmission or torque deviation means (29) is provided which deviates a force, that does not act in the direction of actuation on the actuation device, in the actuation direction B and transmits it to the pedal stand (23) or to the base member (20) so that the articulation of the base member (20) at the pedal stand (23) can be released due to a relative displacement.
15. Actuation device as claimed in any one or more of claims 9 to 14,
c h a r a c t e r i z e d by an adjustment device (26) inhering the characterizing features of one or more of claims 6 to 8.

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Abstract:

The present invention relates to an actuation device for a motor vehicle, including a pedal stand (4) that can be mounted on the vehicle and has articulated to it a base member (2) that is swivelling about a first axis and fixable by means of an adjustment device (7), comprising a housing for a hydraulic or electromechanic generator (12) that points into a vehicle interior in opposition to a direction of actuation (B), and a pedal lever (1) which is pivoted at the base member (2) and includes two legs (8, 9), wherein foot pressure is applicable to the first leg (8), and the second leg (9) acts on the generator (12).

The device permits a simple adjustment of the actuation device to adapt to the comfort requirements of different drivers with different body lengths (leg lengths) and further has an optimized collision performance. Finally, it is favorable that hydraulic generators may also be arranged in the interior of the vehicle.

(Figure 1)

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Actuation Device for a Motor Vehicle

TECHNICAL FIELD

The present invention relates to an actuation device for a motor vehicle.

BACKGROUND OF THE INVENTION

Actuation devices are principally known in the art, especially as the actuation of clutches, and they must satisfy most different requirements. On the one hand, it is imperative for the device to need only little mounting space because the space requirement of this assembly reduces the space that can be used for passengers in the vehicle interior. What is also detrimental to the space available is the steering column that must be passed through a body wall in the area of the point of attachment for a pedal stand. In addition, there are many transverse reinforcements in this area which extend in the way of a horizontally extending support member from one vehicle side to the other vehicle side and thereby reinforce the vehicle compartment.

Because the actuation device has to satisfy the comfort requirements of various operators, the adjustability and adaptability of the pedal lever position to different drivers of different heights, especially buttock-to-ankle length, is absolutely necessary.

Also, the actuation device must comply with safety requirements, i.e., it must have a favorable collision performance. In view of the above, a large number of most different concepts have become known to withdraw the pedal lever actively from the operator in the case of a crash.

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The different approaches available eliminate the above-mentioned problems only in part. Thus, e.g. solutions for swivelling a pedal assembly comprised of master brake cylinder and brake force booster in the case of a crash are not appropriate for the adjustability of the pedal lever position.

In addition, it is a basic need to procure the actuation device from a supplier as an independent unit, quasi isolated from the other vehicle components, to easily mount it onto the vehicle, and to transfer the same solution to other vehicle types. DE 196 17 372 A1 discloses a pedal assembly wherein in the case of a crash a pyrotechnical propellant is ignited, and the gas pressure thereof drives a piston device so that a pedal lever articulation arrangement is released by means of a locking element. A device of this type necessitates a crash sensor and an electronic control unit which sends an ignition signal to the propellant. The employment of pyrotechnical components in a vehicle requires special safety provisions even during the assembly at the vehicle maker's premises because erroneous activations must be avoided in any case at any time.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an actuation device which overcomes all above-mentioned problems and, in addition, permits being integrated into different vehicle types at low cost, without the necessity of special safety provisions for the prevention of malfunctions.

This object is achieved by an actuation device for a motor vehicle, including a pedal stand that can be mounted on the vehicle and has articulated to it a base member that is swivelling about a first axis and fixable by means of an

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adjustment device, comprising a housing for a hydraulic or electromechanic generator that points into a vehicle interior in opposition to a direction of actuation, and a pedal lever which is pivoted at the base member and includes two legs wherein foot pressure is applicable to the first leg, and the second leg acts on the generator.

This object is also achieved by an actuation device for a motor vehicle including a pedal stand that can be mounted on the vehicle, and a base member that is swivelling about an imaginary axis and articulated to the pedal stand by way of bearing means, and an adjustment device which is spaced from the axis between the pedal stand and the base member, wherein the articulation of the base member at the pedal stand can be released so that the base member along with at least one pedal lever articulated thereat is mounted at the pedal stand so as to be swivelling about another axis.

BRIEF DESCRIPTION OF THE DRAWINGS

Figures 1 and 2 show an embodiment of a first actuation device in the maximum front adjustment position and in the maximum rear adjustment position with respect to an operator (not shown), and the actuation end position is shown in dotted lines in each case.

Figure 3 shows a schematic view of an embodiment of a second actuation device.

Figure 4 depicts the same actuation device after a major collision with a deformation of the vehicle compartment in a greatly simplified sketch.

DETAILED DESCRIPTION OF THE DRAWINGS

The actuation device as shown in Figures 1 and 2 has a two-leg pedal lever 1 which is articulated swivellingly at a base member 2 by means of a bolt 3 acting as an axis. Foot pressure can be applied to the first leg 8 of the pedal lever 1, and the second lever 9 acts on a (preferably hydraulic) generator 12, formed fast with the base member, for a hydraulic booster, master brake cylinder, or electromechanic generator 12 for an electromechanic brake device.

The base member 2 is pivoted to a pedal stand 4 which can be secured to a component part 5 formed fast with a vehicle, i.e., a wall, a mounting support, or a similar member. For reasons of standardization, the swing joint between the pedal stand 4 and the base member 2 is preferably effected also by means of a bolt 6, however, any type of swivel joint is principally feasible.

An adjustment device 7 including a threaded spindle-and-nut arrangement is interposed between the pedal stand 4 and the base member 2 in order to permit a precisely regulatable adjustment of the actuation device to different persons, as will be explained hereinbelow. The base member 2 along with the pedal lever 1 is swivelling in relation to the pedal stand 4. Further, a purely mechanically active torque transmission or torque deviation means in the shape of a lever is provided and deviates a force K, that does not act in the direction of actuation on the actuation device, into an actuating force in the actuation direction B, and wherein a swivelling movement of the pedal lever 1 is produced with the lever-shaped torque-transmission or torque deviation means.

In the Figures, a force K opposed to the direction of actuation B is characterized, the cause of which force is e.g.

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a component part which enters into the vehicle compartment due to an accident, or a drive unit or similar element which is displaced due to an accident. Further, the pedal lever 1 is provided as a torque transmission means and, starting from a pedal lever pivot axis that is pivoted at a base member 2, includes two legs 8, 9 which point in different directions and are opposite each other according to the embodiment. There is provision of a foot plate (pad) 10 at one end of the first leg, and at an end of the second leg there is a point of articulation 11 for an actuating member (push rod, linkage, Bowden cable) of a generator 12, especially a hydraulic generator cylinder, master brake cylinder, electric generator with force simulation, or similar elements. The generator 12 along with the pedal lever 1 is arranged at the base member 2 which, in turn, is pivoted on the pedal stand 4. Thus, pedal lever 1 and generator 12 are jointly swivelling in relation to the pedal stand 4. The position of the pedal lever 1 relative to the generator 12 is consequently unaffected during the displacement movement.

A controlled adjustment of the base member 2 can be achieved by means of a preferably motor-driven threaded-spindle-and-nut arrangement or by means of any other type of gear, for example, a worm gear. Another characteristic of the gear employed is that it is a self-locking gear, that means, a position that is adjusted is maintained also in the non-driven condition, without separate locking means. For a special clearance-free locking of the adjustment position it is favorable when the gear is positioned as close as possible to the base member 2 or the pedal stand 4 of the actuation device, without the intermediary of further transmission parts.

An electric motor 13 is flanged to the base member 2 as a drive unit for the adjustment device 7 according to the embodiment. The electric motor 13 drives a threaded spindle or worm, and these structural elements are preferably arranged at one end of a motor shaft integral therewith. However, it is also possible to couple the motor shaft with the mentioned spindle or worm without departing from the spirit of the present invention.

The rotatory spindle or worm movement causes an axial displacement of a type of nut which is mounted on the pedal stand 4. Thus, the adjustment device 7 permits a variation of the relative distance between base member 2 and pedal bock 4. The electric motor 13 swivels together with the base member 2 so that the nut that cooperates with the spindle or worm is mounted swivellingly on the pedal stand 4 corresponding to the adjustment position. It is obvious that a connection to the electrical wiring system is provided (not shown in the Figure) for the energy supply of the electric motor 13, and that the energization can be interrupted by means of appropriate switching means.

Further, it can be favorable to connect the electric motor 13 to an electric control unit with a memory module unit by means of a data bus link 15 and by using the CAN protocol. In this respect, the memory module unit permits having on hand determined adjustment data of the actuation device, especially related to passengers, subject to recall. A bus link 15 with other electrified adjustment devices, such as a seat adjustment, a steering wheel adjustment, a mirror adjustment, or with adjustment devices of other pedal levers of a pedal assembly (which e.g. comprises a brake pedal, an engine control pedal, and, possibly, a clutch pedal) permits storing defined positions of further adjustment devices centrally in a

joint memory module unit and calling the data upon request, for example, by means of a defined code, so that the adjustment devices will favorably adopt the desired position simultaneously.

The effort and structure in the electrical system and also the cost of assembly is effectively reduced when the control unit and also the memory module unit is a part of an electric control unit of an electronically controlled vehicle brake system. It is furthermore advantageous that an actuation sensor which is connected to the control unit is associated with the pedal lever 1. The sensor allows a polling with respect to the pedal actuation condition. Because a polling of the actuation status is permanently executed by means of an algorithm that is implemented into the control unit, this renders possible locking the adjustment function for the case of a pedal actuation. In other words, the control unit does not send any adjustment signals to the electric motor 13, or interrupts the motor's energization, in the presence of a case of actuation.

It is equally possible to provide a crank handle or a hand wheel as a drive which introduce the necessary adjustment movements into the gear arranged close to the pedal by means of appropriate adjustment means, for example, a flexible shaft. The flexible shaft consequently permits arranging the crank handle, wheel, or similar element, at a space outside the leg room which is better accessible to the driver.

The actuation device is designed so that, in the event of a crash with deformations of the front part of the vehicle, a force K that does not act in the actuation direction B on the device is deviated into the actuation direction B , and a swivelling movement in the actuation direction is brought

about with the help of the pedal lever 1 as a torque transmission means. Along with the swivelling movement occurs a brake actuation independent of the driver which will instantaneously bring a vehicle to a standstill which is still rolling, wobbling, skidding, or out of control in any other manner. Thus, the additional advantage that ensues from the present invention is that the risk for uninvolved road users is reduced by minimizing the risk of a consequential accident because a self-braking effect takes place.

As is shown in the Figure 1 embodiment, the force K acts without reversal of direction directly on the generator 12 which is arranged with an actuating rod and an actuating piston and a housing in opposition to the actuation direction B. This means with respect to the first lever arm 8 that a torque transmission takes place inasmuch as the lever arm is entrained in the actuation direction B, i.e., is withdrawn from the foot area, which reduces the risk of injury. In order that the second lever arm 9 comes into contact with a component part that enters into the passenger compartment earlier than the first lever arm 8 does and transmits the force K to the generator 12, a thickened baffle head 14 is arranged at the second lever arm 9.

The embodiments of Figures 1 and 2 illustrate the respectively non-actuated pedal lever position, and the maximum tilting of the pedal lever under maximum actuating force is shown in dotted lines. Figure 1 relates to the rear adjustment position (close to the seat) which is typically chosen by vehicle occupants with a short body length, and Figure 2 relates to a front adjustment position for vehicle occupants with a large body length.

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Another embodiment of the present invention related to a particularly compact design can be seen in Figures 3 and 4. The details which have been described hereinabove with respect to the adjustment device 7 and said's actuation can be transferred to this embodiment. A base member 20 is articulated at a pedal stand 23 that can be mounted fast with the vehicle by means of bearing elements 21 about an imaginary axis 22. The axis 22 principally corresponds to the pivot axis of the above-described actuation device (Figures 1 and 2) and might be formed e.g. by a pin, bolt, or any similar member, which is arranged at the base member 20 or the pedal stand 23. A bearing eye 25 which is to be arranged on either the pedal stand 23 or the base member 20 is used to support a bolt 24. Spaced from the axis 22 is an adjustment device 26 which is interposed between the pedal stand 23 and the base member 20 and by which swivelling about the axis 22 can be performed due to extending or shortening corresponding adjusting means. The said Figure primarily shows the rearward end position, with the front adjustment end position of the pedal levers 27, 28 being shown in dotted lines. Consequently, the base member 20 is pivoted on the pedal stand 23 for adjustment by means of the adjustment device 26.

Insofar the device is still identical to the solution according to Figures 1 and 2. However, a particularly compact construction is achieved because the base member 20 and the pedal stand 23 are arranged in parallel to each other or at least at an acute angle in relation to each other, with the pedal stand 23 being arranged beneath a steering axis and at the said. An enhanced collision safety is achieved because the frontal deformation of the vehicle compartment brings an end to the articulation of the base member 20 at the pedal stand 23, and the base member 20 along with at least one pedal lever

27, 28 mounted thereon is fitted to the pedal stand 23 so as to be swivelling about another axis.

Figure 4 illustrates in this connection principally the deformations which occur after a major impact in the area of a firewall (splashboard) 30 of a vehicle compartment, whereby a component part (such as an engine block, axle, foreign body, or similar elements) is moved in the direction of force K into abutment on the torque transmission means 29. The other, new axis of the base member 20 is defined by a point of articulation of the adjustment device 26 at the pedal stand 23. According to the embodiment, the bearing means 21 (bearing eye 25, bolt) are unlatched due to displacement of the pedal stand 23 and the base member 20 in relation to each other. It is advisable when the bearing eye 25 is designed to be partly open in the way of a claw, or when a closed bearing eye 25 tears off along a predetermined nominal breaking point due to the relative displacement so that the articulation can be released. For example, an active displacement of the base member 20 including the bolt takes place in the direction of the driver so that the bolt, as is illustrated in Figure 4, is unhinged from the claw. Of course, other equivalently active arrangements are also feasible with respect to the bearing means 21, without departing from the present invention.

It is further advantageous that a torque transmission means or torque deviation means 29 is provided which deviates a force which does not act in the direction of actuation into the direction of actuation and transmits it onto the pedal stand 23 or the base member 20 so that the articulation of the base member 20 at the pedal stand 23 is releasable due to relative displacement. More specifically, the force effect K that originates from a movement of a component part in the direction of the driver is deviated into a direction of

actuation B so that there occurs a relative displacement between the base member 20 and the pedal stand 23 which causes unlatching of the first point of articulation. This allows a swivelling movement of the base member 20 that is decoupled (from the original adjustment axis) together with the pedals 27, 28 (about a new swivelling axis) in the direction of the front part of the vehicle, which is a safer position . It is self-explanatory that all features relating to the adjustment device 26 of the first solution (Figures 1 and 2) can be transferred to the second solution (Figures 3 and 4).

At least one pedal lever articulated to a base member was partly referred to in the above description. Of course, the present invention can be transferred to several pedals which are combined in one single pedal assembly. The present invention is appropriate especially for combinations of engine control pedals and brake pedals, or for combinations of engine control, clutch, and brake, wherein one or more brake pedals inhere the features of the present invention and are adjustable separately of each other or jointly.

Actuation Device for a Motor Vehicle

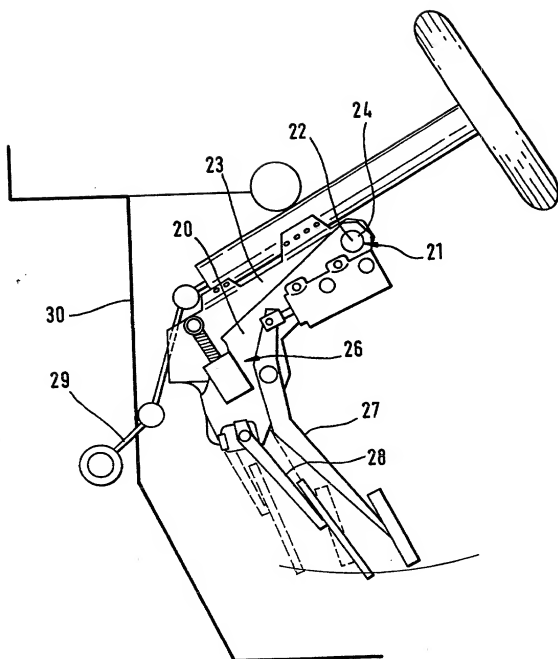
ABSTRACT OF THE DISCLOSURE

The present invention relates to an actuation device for a motor vehicle, including a pedal stand that can be mounted on the vehicle and has articulated to it a base member that is swivelling about a first axis and fixable by means of an adjustment device, comprising a housing for a hydraulic or electromechanic generator that points into a vehicle interior in opposition to a direction of actuation, and a pedal lever which is pivoted at the base member and includes two legs, wherein foot pressure is applicable to the first leg, and the second leg acts on the generator. The device permits a simple adjustment of the actuation device to adapt to the comfort requirements of different drivers with different body lengths (leg lengths) and further has an optimized collision performance. Finally, it is favorable that hydraulic generators may also be arranged in the interior of the vehicle.

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Fig. 3





Declaration and Power of Attorney for Patent Application Erklärung für Patentanmeldungen mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides
Statt:

As a below named inventor, I hereby declare that:

daß mein Wohnsitz, meine Postanschrift und meine Staatsangehörigkeit den im nachstehenden nach meinem Namen aufgeführten Angaben entsprechen, daß ich nach bestem Wissen nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent für die Erfindung mit folgendem Titel beantragt wird:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Betätigungsvorrichtung für ein Kraftfahrzeug

Actuation Device for a Motor Vehicle

deren Beschreibung hier beigelegt ist, es sei denn (in diesem Falle Zutreffendes bitte ankreuzen), diese Erfindung

the specification of which is attached hereto unless the following box is checked:

☒ wurde angemeldet am 26.05.2000
unter der US-Anmeldenummer oder unter der Internationalen Anmeldenummer im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT). PCT/EP00/04802

☒ was filed on 05.26.2000
as United States Application Number or PCT
International Application Number PCT/EP00/04802

Ich bestätige hiermit, daß ich den Inhalt der oben angegebenen Patentanmeldung, einschließlich der Ansprüche, die durch einen oben erwähnten Zusatzantrag und in einem „preliminary amendment“ abgeändert wurden, durchgesehen und verstanden habe.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above and as amended in a preliminary amendment.

Ich erkenne meine Pflicht zur Offenbarung jeglicher Informationen an, die eventuell zur Prüfung der Patentfähigkeit in Einklang mit Titel 37, Code of Federal Regulations, § 1.56 von Belang sind.

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German Language Declaration

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäß Title 35, US-Code, § 119 (a)-(d), bzw. § 365(b) aller unten aufgeführten Auslandsanmeldungen für Patente oder Erfinderurkunden, oder §365(a) aller PCT internationalen Anmeldungen, welche wenigstens ein Land ausser den Vereinigten Staaten von Amerika benennen, und habe nachstehend durch ankreuzen sämtliche Auslandsanmeldungen für Patente bzw. Erfinderurkunden oder PCT internationale Anmeldungen angegeben, deren Anmeldetag dem der Anmeldung, für welche Priorität beansprucht wird, vorangeht.

Prior Foreign Applications
(Frühere ausländische Anmeldungen)

19927775.3	Germany
19936937.2	Germany
19953002.5	Germany
Number	Country

Priority Not Claimed
Priorität nicht beansprucht

17/June/1999 ☐
05/Aug/1999
04/Nov/1999
Day/Month/Year Filed ☐

Ich beanspruche hiermit Prioritätsvorteile unter Title 35, US-Code, § 119(e) aller US-Hilfsanmeldungen wie unten aufgezählt.

Application No. , filed on

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Application No. , filed on

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den (die) nachstehend aufgeführten Patentanwalt (Patentanwälte) und/oder Vertreter mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Angelegenheiten vor dem US-Patent- und Markenamt:

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Kevin Rutherford 40,412
Michael B. Stewart 36,018


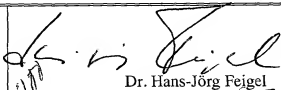
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Signature _____ Date _____ State/Country _____ Citizen of Germany	Signature _____ Date _____ Street Address _____ City _____ State/Country _____ Citizen of



If box is checked, subsequent inventors are listed on a separate sheet